

# ENVIRONMENTAL Fact Sheet



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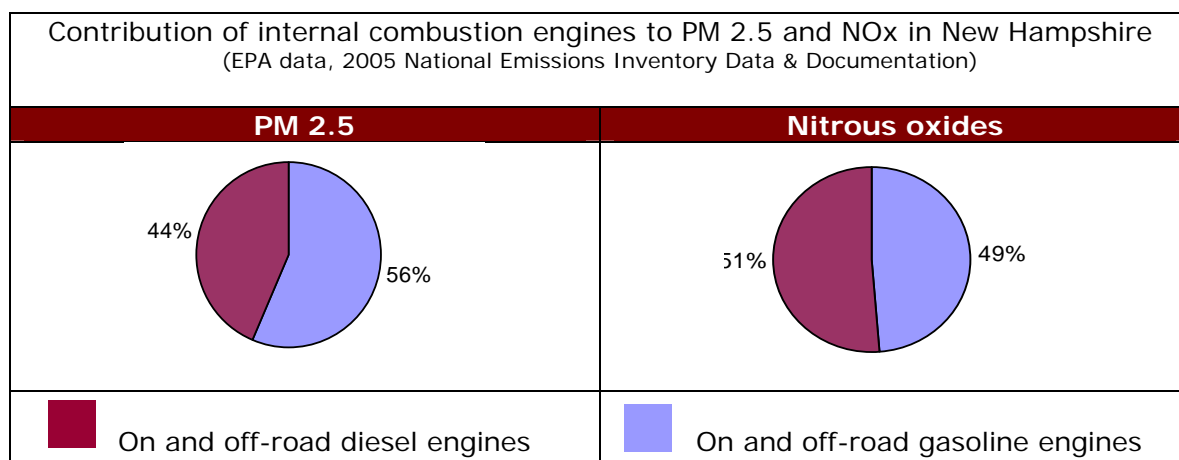
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## Diesel Vehicles and Equipment: Environmental and Public Health Impacts

### Environmental Effects

As shown in the chart below, diesel emissions are major contributors to NO<sub>x</sub> and PM 2.5 in the state. Additionally, emissions in the heavily traveled Northeast corridor are transported into New Hampshire, leading to higher ozone smog concentrations than would otherwise occur.



Environmental impacts of diesel exhaust remain a concern both here in New Hampshire and regionally. Efforts to reduce emissions from diesel engines, both on and off-road, will result in reductions of NO<sub>x</sub> and PM and will also decrease emissions of other pollutants including sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), and toxic air compounds like formaldehyde. Another component of diesel exhaust has the potential to contribute to global warming. Black carbon, or soot, is a fine particulate composed of pure carbon that is emitted to the atmosphere by biomass burning, cooking with solid fuels and diesel engines. A recent study<sup>1</sup> indicates that black carbon may contribute more to global warming more than any other greenhouse gas after carbon dioxide. One way soot contributes to climate change is by absorbing heat while it is airborne which warms the air. Another way is by depositing on snow and ice causing sunlight to be absorbed rather than reflected.

<sup>1</sup> University of California – San Diego (2008, March 24), Black Carbon Pollution Emerges As Major Player in Global Warming. Science Daily.

Other environmental effects include:

- Crop and forestry losses from ozone and acidified soils.
- Visibility degradation from regional haze caused by SO<sub>2</sub>, PM, NO<sub>x</sub> emissions.
- The acidification, nitrification, and eutrophication of water bodies from NO<sub>x</sub> and SO<sub>2</sub> emissions.

### **Public Health Effects**

Diesel exhaust is a complex mixture of pollutants in gas and particle form. The particulate matter, PM, poses the greatest health risk due to its ability to absorb the estimated 40 cancer-causing substances present in diesel exhaust, and also for its ability to penetrate deeply into the lung. Documented short-term health effects associated with diesel exhaust include eye, nose and bronchial irritation, lightheadedness and nausea, and respiratory symptoms including asthma-like responses<sup>2</sup>. Long-term health effects include chronic bronchitis, premature death, and decreased lung function in children. Several national and international agencies have concluded that diesel exhaust is a probable human carcinogen. The California Air Resources Board estimates that, statistically, diesel engine emissions are responsible for the majority of cancer cases attributable to air pollution.<sup>3</sup>

An additional area of concern for DES is exposure to diesel exhaust by children while traveling to and from school each day on buses. In a Yale University study<sup>4</sup> children were found to be exposed to airborne particulate concentrations that were sometimes five to 15 times higher than background levels of PM. DES is currently engaged in a voluntary initiative to reduce school bus idling to help protect school children and others from exposure to diesel exhaust. For more information, visit the Clean School Bus/School Community Idling Reduction Campaign web page on the DES website <http://des.nh.gov>.

Another health problem associated with diesel exhaust is its disproportional impact on low income urban neighborhoods. Advocates for environmental justice<sup>5</sup> cite proximity to traffic congestion and transportation hubs as the cause. Occupational exposure may present an increased risk to diesel exhaust related health issues to truck drivers, railroad workers and equipment operators.

For more information on diesel vehicles and equipment, please see the DES website at [http://des.nh.gov/organization/divisions/air/tsb/tps/msp/heavy\\_duty.htm](http://des.nh.gov/organization/divisions/air/tsb/tps/msp/heavy_duty.htm) or contact Felice Janelle, DERA Program Manager, at (603) 271-4848 or [felice.janelle@des.nh.gov](mailto:felice.janelle@des.nh.gov).

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<sup>2</sup> U.S. Environmental Protection Agency. (2002) Health Assessment document for diesel engine exhaust. Prepared by the National Center for Environmental Assessment, Washington, D.C., for the Office of Transportation and Air Quality; EPA/6008-90/057F.

<sup>3</sup> For more on diesel exhaust, see “Diesel Exhaust in the United States” an EPA report at <http://www.epa.gov/cleandiesel/documents/420f03022.pdf>, and “Health Effects of Diesel Exhaust Particulate Matter,” Air Resources Board, at [http://www.arb.ca.gov/research/diesel/dpm\\_health\\_fs.pdf](http://www.arb.ca.gov/research/diesel/dpm_health_fs.pdf).

<sup>4</sup> “Children’s Exposure to Diesel Exhaust on School Buses,” Environment & Human Health Inc., <http://www.ehhi.org/reports/diesel/>

<sup>5</sup> <http://www.epa.gov.oecaerth/environmentaljustice/>